

If the concept of universal service is to be redefined for all consumers so that all benefit equally, universal design must be a critical component. The Trust has been a valid attempt to remedy the current telecommunications inequities of people with disabilities. At the same time, it is too limited a vehicle to ever address our real need for access onto the information highway.

If Pacific Bell does not include universal design in its strategic thinking now, it will contribute to the burdens placed on a limited instrument like the Trust, as well as on the ratepayers who are taxed to support it.

## Recommendations and Pacific Bell's Response

- 1) **Incorporate universal design into the product development process from the beginning, and throughout the process.**

The AGPD does not believe that the incorporation of universal design into Pacific Bell product development will be a simple, one-step process, accomplished overnight. The following are suggested actions designed to introduce universal design as an intrinsic part of the product development process at Pacific Bell:

- 2) **Require product developers to use the resources and skills of Human Factors Engineering in San Ramon as a critical step in the design and development of all new products.**
- 3) **Add both staffing and training capabilities to Human Factors in order to provide the necessary expertise to product managers on functional design requirements for people with disabilities.**
- 4) **Develop practical, workable "filters" in Human Factors that can be applied at all critical phases of product development.**

### *Company Response to Recommendations 1-4:*

We agree incorporating universal design into the entire product development process will result in better designed products for all customers and more accessible products for customers with disabilities. We welcome the challenge of breaking new ground relating universal design to telecommunications. As we reinvent Pacific Bell's culture and processes, we commit to building capability of those involved with product design and management. We believe universal design is a disciplined way of thinking that makes sense for our product process.

We expect changing the processes you identified to take time, although our work will have clear and measurable milestones. Prior to our meeting next year we will:

- Develop a training course on Universal Design.
- Train one member of every major product team.
- Define Human Factors' role in the product process.
- Develop guidelines for how to use Human Factors.
- Draft principles on universal design that are useful to product design teams.
- Select two products to which we can begin applying universal design principles.
- Develop an initial working filter by systematically capturing questions from our experience applying universal design to the products selected.
- Begin incorporating universal design principles into vendor requirements.

We have already worked with Bellcore to change its product screening process. Bellcore now includes as part of its regular assessment the impact or application of the product concept on people with disabilities and the size of the potential market.

The business made a similar change when it decided to do business in

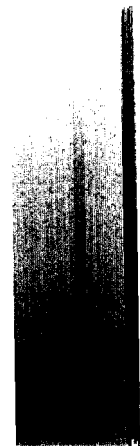
Spanish. The process of integrating Spanish early and in an appropriate manner took several years. Today, however, it's one of our fastest growing segments, responsible for 80% of Pacific Bell's new access lines in 1993. Your work has shifted our thinking. We now understand incorporating universal design will challenge us to develop more creative new product designs that will help Pacific Bell fulfill its vision of being more competitive and accessible to all Californians.

**5) Require the appropriate leaders of product development to ensure that "filter questions" related to specific disabilities be analyzed and answered for every new product developed by Pacific Bell.**

**Company Response:**

We agree accountability is important. This report and its response will help communicate that Pacific Bell's leadership expects those in the product development and management organizations to consciously consider the needs of people with disabilities. We will seek to provide the appropriate tools and guidance, such as those described above, to enable managers to fulfill this expectation.

The product development board, which will be introduced with the new product process, will give product teams go or no go decisions at key points in the process. This board will also



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of integrating appropriate resources. Today, the fastest growing is 80% of Pacific Bell in 1993. Your thinking. We now are using universal design to develop product designs that fill its vision of a more accessible and accessible

appropriate leaders of the industry to ensure that the needs of people with disabilities are analyzed and new product designs are developed by Bell.

It is important to ensure that the needs of people with disabilities in the product development process are fully considered. We will consider the needs of people with disabilities in the product development process. We will consider the needs of people with disabilities in the product development process.

on the board, which will ensure that the new product teams are fully aware of the needs of people with disabilities. We will also ensure that the new product teams are fully aware of the needs of people with disabilities.

complete the training course on universal design. Once we have a filter in place for all product teams the board will reinforce the steps which cause managers to consider the functional needs related to people with disabilities. However, it will be critical and more challenging for product teams to address the needs of people with disabilities prior to reaching the board

**6) Include people with disabilities in the beginning and test phases of all new product designs.**

An effective way to involve (indirectly) customers with disabilities in the design of products that meet their needs is by developing appropriate questions for product designers that target and focus on those needs.

Consider the issue "hard of hearing." Questions that a product manager needs to think through and investigate with Human Factors might include: How does someone with a hearing loss use this product? Will it function with an amplifier or a hearing aid? Does it use audible signals that can be converted to visual ones? Will some enhancement or alternative feature of the product increase or improve the customer's usage or convenience?

(NOTE: See Appendix for preliminary filter questions relating to all functional disabilities identified in this report.)

**Company Response:**

We agree. It makes sense to include people with disabilities in the beginning and test phases of new product designs and it will help us incorporate universal design in the new product development process.

The Advisory Group's existence has already helped Pacific Bell understand the value of including people with disabilities in trials and research. The company will ask product development teams to make a conscious decision about including customers with disabilities. Several examples follow which demonstrate the change in the company's behavior the AGPD inspired:

**Trials**

- 'People with Disabilities' were not involved in the initial **Voice Dialing™** product design undertaken by either Bellcore or Pacific Bell. However, they were discussed (at length) as potential users of the service by both design teams. We have included customers with disabilities in our market trial. As of this moment, it appears that the users with disabilities are as active and in some cases more active than the non-disabled users. Post trial market research will provide the final word on customer use and opinion.

- **New Number Referral Services** are now under consideration. The application of these services for people with disabilities has been included in the assessment of market potential since the beginning. The AGPD participated in that assessment as a focus group last year.

The Number Referral product development team will work with Human Factors Engineering in all phases of the product design and testing. If the new Number Referral Services are approved for deployment and funded by the company, technical development for TDD users will take place concurrently within the product process. Then, pending CPUC approval, the new products will be accessible and usable by TDD users at the time of product introduction.

- **The Electronic Publishing Group (EPG)** will certainly involve people with disabilities in the design and development of its products and services. We are developing a wide range of products that will be available across a variety of delivery platforms including telephones, computers, personal digital assistants, and interactive television. Each of these delivery platforms has its own unique capability to meet the needs of people with disabilities. Because so

much of our development is in the area of multimedia services, we can consider using audio, video or special keyboards to help increase products' accessibility.

#### Research

Pacific Bell's Marketing Research Services will educate its clients about the opportunity to include customers with disabilities. Research Services works with (Pacific Bell) clients in two ways, on project specific research, and on company wide demographic and telecommunications use research. For project research the client, considering our advice, ultimately approves the target population.

Last year, we conducted two surveys of customers with disabilities. In addition to learning valuable information we increased our awareness of and sensitivity to people with disabilities. In 1994 we will conduct a major survey for all product teams to use which will include people with disabilities as well as questions pertinent to telecommunications and disabilities.

#### **7) Direct vendors (CPE, network switches) to address specific issues of functional access for customers with disabilities as part of their contractual arrangements with Pacific Bell.**

Working with Human Factors, the company's Procurement Department

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needs to determine specific guidelines  
for manufacturers of CPE and suppliers  
of network equipment and software.

### CPE

In very preliminary terms, those specs  
might include the weight of handsets or  
control devices that are lifted; the  
amount of pressure required to control  
wands, joysticks, or push buttons; the  
size of buttons on keypads; the design  
of raised buttons versus flat buttons on  
devices used to access  
telecommunications; the background  
colors or patterns on display screens; or  
capability for input/output ports to  
attach hardware such as voice  
synthesizers.

### Network equipment

Network switch technology must also  
(where it makes sense) have the built-  
in capability to supply audio, text, and  
Baudot — in other words, redundancy  
that assures information access to the  
widest number of users. Until recently,  
Pacific Bell did not provide its Number  
Referral Service in Baudot (the method  
of communicating information to  
TDDs, or Telecommunications Devices  
for the Deaf). The network equipment  
did not have that capacity, so it  
required going to a third-party to  
retrofit the original design. This is  
precisely the sort of problem and  
expense that can be avoided by  
applying principles of universal design

and establishing these design  
specifications for all network vendors.

Also Pacific Bell should consider  
commissioning an advisory body  
consisting of representatives from the  
major telco companies, equipment  
suppliers, and network vendors, and  
charge it with developing universal  
design standards that cut across the  
entire industry and address the needs of  
people with disabilities.

### **Company Response:**

We agree addressing specific issues of  
functional access through vendors also  
makes a great deal of sense. Our goal  
over the next year is to better  
understand the requirements which can  
increase access and develop principles  
we can incorporate into vendor  
requirements.

For many products, Pacific Bell  
purchases technology that has products  
(or features) designed in by the  
manufacturer. In these cases, it will be  
critical for Pacific Bell and the  
disability community to work with  
vendors early. Presently, only our joint  
marketing contracts identify  
requirements; it requires vendors to  
provide CPE that is hearing aid  
compatible. Other times Pacific Bell  
may simply provide the pipe and we  
have little to no control over how the  
product (content) is designed.

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## CHAPTER TWO

# ENHANCING CURRENT ACCESSIBILITY

**T**elecommunications products on the market today were not developed to meet the functional needs of people with disabilities. The AGPD recognizes several opportunities for Pacific Bell to reverse that omission and begin marketing existing products and services to this underserved market.

The time to do that is now. The 1980s was a decade of significant policy action in the realm of disability and telecommunications access. As an example, California took the lead in removing what has been the most difficult barrier facing deaf people — making the network more accessible through a 24-hour professional relay service. All other states now provide similar services as a result of the Americans with Disabilities Act signed in 1990.

In California the concept of POTS is beginning to lose meaning, and the concept of Universal Service is undergoing revisions driven by new technology. We consider the timing of that shift a new opportunity for people with disabilities. As the melding of computers and telecommunications intensifies, the telecommunications industry has become a testbed for hundreds of innovations that could benefit people with disabilities.

The potential to create new opportunities cuts both ways. At a time of mounting competitive urgency, leveraging its products and technology to meet the needs of consumers with various functional disabilities can bring new market share to Pacific Bell.

In our recommendations (below), we offer ideas to encourage Pacific Bell to review its current offerings in new ways that might better serve all its customers, including people with disabilities.

### Pricing

Barriers to people with disabilities are not only technical; they are also economic. The cost of equipment and services that people with disabilities must bear for day-to-day access to other people or information (primarily for customized CPE and computers) is often much higher than for the general population.

The AGPD understands that in order to justify offering products and services in an increasingly competitive market, Pacific Bell must have a sound basis for expecting a reasonable return on investment, as well as knowing the target market's willingness and ability to choose a product offering and pay a reasonable fee.

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The AGPD's position on affordability is this: Pacific Bell must strive to develop products that meet the accessibility needs of people with disabilities, but must give all customers different pricing plans from which to select.

## Two Principles on Pricing

The AGPD recommends adoption of the following pricing principles concerning products/services for people with disabilities:

- 1) If a company has to retrofit a current product to make it accessible, **then the company should not pass on its costs exclusively to customers with disabilities.**
- 2) When a product is available in alternate formats at varying prices, **the company must provide customers with disabilities the lowest price for the format that is accessible to people with the particular disability — even if that format has a higher price to other customers.** (See sidebar)

## Pricing Options: Practical Examples

Let's assume Pacific offers 411 information in alternate media with the following prices: printed Directory (free), live operator (nominal charge), audiotext (higher charge), and videotext (highest charge). Here's how

different pricing options might apply:

- Blind or other customers with vision impairments should not be charged for using the live operator since the printed Directory is inaccessible to them.
- The blind customer would be charged for the audiotext option.
- A deaf customer should be charged for any of the enhanced options since the printed directory is an accessible form of information.
- If the company agrees to offer direct TDD access to 411, then it could not charge for the first three calls (the same pricing arrangement for hearing customers calling 411).

## Enhanced Yellow Pages

- Pacific Bell Directory could offer a higher pricing scheme to both hearing and deaf customers for access to enhanced delivery of Yellow Pages information.
- Pacific Bell Directory could also charge deaf customers for direct TDD-accessible Yellow Pages information if hearing customers were charged for calling a live operator to get Yellow Pages information.

## Recommendations and Pacific Bell's Response

- 8) Continue the market focus toward people with disabilities so the business and product teams can understand this segment adds revenue, in addition to helping the company improve its product designs.

Telecommunications technology can help level the playing field for people with disabilities. We congratulate Pacific Bell for its foresight in viewing people with disabilities as a viable market. The AGPD believes it will happen sooner if the company understands people with disabilities can also add revenue. We have reviewed some of the early data on population and revenue, its clear there's a market. We are confident Pacific Bell will balance its need to make money with its public trust commitment to provide universal access to all Californians.

### Company Response:

We agree the business needs to view people with disabilities as a market. The company chartered a Market Team to work with product teams and develop a market plan. The team works with internal groups to increase the business' knowledge of the needs of customers with disabilities. The business will issue the market plan in 1994. The plan will provide data on

the market size and identify opportunities and strategies for Pacific Bell to pursue.

- 9) Provide printed materials in a variety of media to better meet customer needs.

The AGPD wants Pacific to give customers a choice of media for the printed material they receive. This includes bills, information brochures, customer instructions, and marketing materials. While the company has made notable efforts in the past to improve the readability of its bills and printed materials for the general public, it now needs to focus on ways to improve the presentation and delivery of these materials for people with disabilities. Much of the information Pacific Bell supplies simply is not accessible in its current format. Specific action steps follow:

- ❖ Use audiotext services as a means of disseminating information.

Audiotext is especially helpful for customers with vision impairments and certain learning disabilities (e.g., dyslexia). Pacific Bell can learn from a number of support organizations for the blind, whose expertise includes using a "tone indexing" format in recorded messages, which makes audio information easier to comprehend and use.





Audiotext systems used by Pacific Bell could:

- Provide a 24-hour menu of information that would free up operators and service reps.
- Make bills more comprehensible to any customer by utilizing "tone indexing" (as done by Recording for the Blind) to help the listener find specific parts of the bill.
- Provide a thorough description of new product options and special promotions.

#### **Company Response:**

Pacific Bell now uses an audiotext system to communicate important information to its customers. 1.800.2.INFORM provides time-sensitive information about topics that are useful for customers. The system was introduced during the past year and can be accessed 24 hours a day, toll free, from any touch-tone phone in California.

It's a menu-driven application, unlike a recorded book which is a sequential application. Customers, visually impaired or not, simply press the buttons on their touch-tone phone to hear specific information. Tone indexing would not work with the menu driven applications.

- Recent 1.800.2.INFORM subjects have been:

- ❖ Inside Wire service options
- ❖ Lifeline service
- ❖ Preventing toll fraud
- ❖ Safety tips for kids
- ❖ 714/909 area code split
- ❖ Telecommuting

- We offer a 1.800.2.INFORM for Spanish, Vietnamese, Cantonese, Mandarin and Korean-speaking customers in their native languages, as well as a line for TDD access (1.800.995.8213).

#### Bill Inserts

- Each bill insert is sent to the Telephone Pioneers, our employee volunteer organization, which enters the information on a computer bulletin board. Subscribers throughout the state access the information by calling 415.864.6430.
- ❖ **Research other formats that would serve the information needs of people with disabilities.**

Other media which customers may want includes information on disk, in Braille, or in large print (14-18 point). Pacific Bell must research and decide which brochures and materials lend themselves to different formats for people with different disabilities, and make them available to customers.

### Company Response:

Pacific Bell will review its residential collateral over the next year to determine when alternate formats, mainly large print, would better meet the needs of the customers and the business.

On any research activity having to do with customer communications, Marketing Research Services will remind project managers of this market segment and suggest that alternative media may be appropriate to consider in order to serve our entire customer base.

### ❖ Start with the phone bill.

The monthly telephone bill should be the company's first priority. Make it available in alternate formats. For example large print bill would assist low vision customers (about 1M) and help Pacific Bell distinguish itself in the market place. Pacific would save a considerable sum if it could issue customers' bills on disk instead of mailing several pages of paper in an envelope. A disk would provide a more accessible format for customers who have computer "screen readers" that translate text to voice (as do many who are blind or visually impaired). This could also be a good "preview" or trial of the viability of similar videotext services for the general market.

### Company Response:

Currently the Pacific Bell phone bill for residential customers is available as a standard print bill. There is a service offered to business customers that provides the bill on a computer disk. This product is not designed for residential customers and carries an additional charge.

Pacific Bell has just completed a feasibility analysis for the large print bill. We have begun development and anticipate a product will be available within a year.

Pacific Bell is also planning to offer the bill in a variety of media to business and residence customers. When approved, customers will have a choice of media in which to receive the first copy of their monthly bill (e.g., standard print, computer disk) at no charge. The current timeline calls for offering the bill in any legal media in the 1995-1996 time frame.

### 10) Offer Directory Assistance, White Pages, and Yellow Pages in different media, especially Baudot-accessible formats.

This is an expansion of the recommendation above. We know that Pacific Bell and Pacific Bell Directory regard these products as essential services, and will do everything possible to maintain and build marketshare through the application of new technologies. Many

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would pay extra to use alternate media that offered solutions to our information obstacles. Making these services more accessible to people with disabilities in alternate formats — videotext, audiotext, and fax — would also provide electronic curb cut “tests” for a much wider marketplace.

TDD access to 411 Directory Assistance should be a top priority. Today the deaf community must dial a ten-digit number to access AT&T’s Operator Services for the Deaf, who in turn calls the 411 or long distance operator in the appropriate area code location. It’s cumbersome for TDD users and costly for all ratepayers.

**Company Response:**  
Directory Assistance (DA) and White Pages  
We currently provide a directory assistance exemption to customers who are unable to see or manipulate the White Pages. Customers must provide Pacific Bell with certification of their disability to receive the exemption. Today, Pacific Bell cannot technically provide customers direct electronic access (e.g. PCs) to the DA database. When Pacific Bell replaces the existing retrieval system and permits external access, we will work to make the new retrieval system TDD accessible. However, the single line display on TDD terminals may be a barrier to locating common names listings (e.g. Bob Smith) in the DA database.

Yellow Pages  
The mission of the Electronic Publishing Group (EPG) is to develop interactive shopping and information products across a variety of delivery platforms ranging from the telephone to the computer to interactive television. Our objective from the start has been to develop a fundamental product and database that meets the needs of our consumers and advertisers and to deliver it across as many platforms as make sense for that product. It is our mission to do this and, therefore, by design we meet the recommendation.

We are actively developing such shopping and information services in two ways. Through our recently announced joint venture with the LA Times, we will be developing a broad based shopping network that assists individuals in finding the businesses, products and services they need through the assistance of a live shopping consultant delivering information over the telephone. In addition, we will be pursuing additional products delivered in an on-line environment. Outside of the venture, we will be developing interactive shopping malls that can be accessed through interactive television. In development, and as these products gain acceptance in the marketplace, we commit to considering their ability to help meet the needs of people with disabilities.

**11) Promote video teleconferencing applications that create greater access for deaf, hard of hearing, and speech-impaired customers.**

Today, sign language interpreters, who are hired to be a link between deaf and hearing people, often get more money for travel time to and from an assignment than they earn for actually performing their job. (Interpreting agencies pay an average \$40 per hour.) The shortage of interpreters in most counties in California also means that it is difficult to schedule the service on short notice.

Video teleconferencing services could fill the gap. Teleconferencing can provide more efficient and available American Sign Language interpreting to a wide range of current users — schools and community colleges, universities, hospitals, public gatherings, and many other institutions.

For example, colleges and universities can hire an interpreter in one location and distribute the class — to both hearing and deaf students — to satellite campuses in other locations. Hospitals and medical or professional office buildings can share a centralized video teleconferencing system and utilize interpreters, on shorter notice and at less expense.

**Company Response:**

Pacific Bell has conducted trials of video teleconferencing with customers who use American Sign Language (ASL). These trials were met with enthusiasm by deaf customers. Pacific Bell will ensure that our sales force understands this application.

Pacific Bell recognizes the potential value of video conferencing for a wide range of applications. Customers in the education and health care market segments have expressed a great deal of interest for various distance learning and telemedicine applications; colleges and hospitals are prominent on the video conferencing customer user list. We are currently working with San Diego State to establish a video teleconference using interpreters in San Diego and deaf people in both San Diego and Alameda. This will be a further demonstration of the value of video teleconferencing and its use in reducing interpreter costs.

Pacific Bell recently announced the Education First Program, which offers network connections for video conferencing available free for one year to elementary and secondary schools, as well as community colleges. This program will stimulate the deployment of video conferencing technology in environments that are accessible to and supportive of people with disabilities. This creates an opportunity to increase the availability of shared sign language

interpreting and other visually oriented services.

**12) Test, develop, and promote ISDN's advanced sound quality to hard-of-hearing people.**

Judging from Pacific Bell's introduction of this new technology, ISDN looks like it may provide a giant leap in information capability to all who have access. Among its many advantages, ISDN could dramatically improve the quality of conversations over the phone lines for people who are hard-of-hearing.

That could be a tremendous improvement for the largest segment of people with disabilities requiring the most improved access to telecommunications. Pacific Bell, working with audiologists and other experts, needs to determine what frequencies of hearing loss are amenable to specific technical remedies that ISDN could provide.

Once implemented, this ISDN "hearing service" could become a major marketing tool for Pacific Bell to groups who might otherwise have difficulty appreciating how they benefit from this "pretty awesome new stuff" (PANS).

For example, senior advocacy groups might be more easily persuaded to support ISDN as integral to redefining Universal Service if relevant applications that they need were more fully developed.

**Company Response:**

Pacific Bell agrees with this recommendation, however, it isn't technically possible at this time. We asked the Strategic Issues Group to put together an assessment of what these customer needs are, what technical capability is required, and an estimate of price sensitivity. We learned that currently CPE produced for ISDN cannot use two B channels simultaneously which is needed to deliver 7Khz audio. We will however share this idea with manufacturers.

**13) Promote Priority Ringing<sup>tm</sup> to households with deaf and hearing customers.**

Priority Ringing<sup>tm</sup> allows users to choose up to ten numbers and pre-program them into the phone. When someone from one of those numbers calls, the phone rings with a distinctive ring. When a standard phone rings in a household of both deaf and hearing people, the deaf person sees a visual indicator (usually a flashing light) and hearing people hear a standard ring pattern. A deaf person has no way of knowing whether to answer the call by switching on the TDD to communicate.

Priority Ringing<sup>tm</sup> could help solve this problem. It would not only benefit the household (where TDD calls ring with the distinctive ring, and voice calls with the standard ring, for example), but also the caller whose number has

been pre-programmed. That's because when a hearing person picks up the phone and answers by voice, the operator of the TDD device that's communicating on the other end may interpret the signal as busy or the wrong number. This time delay and confusion could be avoided if deaf and hearing households understood services like Priority Ringing<sup>tm</sup> already available to them.

**Company Response:**

Pacific Bell's opportunity to promote this product to its entire customer base is limited. Once Priority Ringing<sup>tm</sup> has been upgraded to work on calls from outside the local area, there will be more potential to promote this product since it will be more valuable to our customers. Presently, Priority Ringing<sup>tm</sup> only works within one calling area (LATA).

However, two options remain viable. First, Pacific Bell will promote Priority Ringing<sup>tm</sup> when advertising Custom Calling Services. Second, we will also train the service representatives who speak with TDD users on this application.

**14) Make the Message Center accessible to TDD users.**

The Message Center is a classic example of a product that Pacific Bell could have designed for greater accessibility with people of disabilities

in mind. Unfortunately, the prompts used are voice only and the system is not designed to reproduce Baudot tones. A deaf TDD caller cannot use the system.

Deaf customers using TDDs have no idea if they've reached someone's voice mail, wrong number, or a busy signal. Baudot tones are incompletely recorded on the voice mail system, so that played back messages do not usually include all typed characters, resulting in confusing or incomprehensible communication.

As Pacific Bell Information Systems considers ways to correct this problem, the AGPD suggests that a workable design needs to allow households with both deaf and hearing people to use the Message Center. The potential market for this voice mail product includes friends and family of deaf users, as well as businesses and nonprofit organizations that regularly communicate with deaf individuals.

**Company Response:**

Pacific Bell Information Services (PBIS) is investigating the technical and economical feasibility of modifying The Message Center to provide the necessary Baudot tones to support TDDs. In its investigation, PBIS is considering product designs which support both deaf only households and combination deaf and hearing households. PBIS is also investigating various ways in which customer support

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may be provided to deaf customers of  
the potential TDD Message Center  
service.

**15) Make products for education  
accessible to expand the  
potential market to include  
special education.**

Pacific Bell has recently announced it  
will connect every school and library to  
the information highway. It is also  
trialing services for the education  
market: Knowledge Network Gateway  
and Classlink™. We commend Pacific  
Bell for its forward thinking and  
leadership supporting two critical  
institutions. The Gateway trial also has  
a home version that is accessible to  
blind and visually impaired users. The  
option must remain. As Pacific Bell  
pursues additional products for schools  
and libraries, its imperative to design in  
access for people with disabilities. The  
AGPD believes Pacific Bell could find  
special education a substantial market  
opportunity.

**Company Response:**

The Knowledge Network Gateway is  
an information service developed by  
Pacific Bell. The dial-in navigation  
software uses the VT100 emulation  
protocol for the user interface. This is a  
basic character mode interface. The  
interface, though not graphic and glitzy,  
can run on almost any computer or  
terminal, thereby allowing equity of  
access. VT100 character based services

can also be interfaced with other  
software or hardware which gives the  
user added capabilities, including text  
to voice capabilities and the ability to  
make type larger.

It is the intention of the Knowledge  
Network product development group to  
enhance the dial-in user interface to a  
graphical user interface in the future.  
The group also intends to keep the  
VT100 interface which can be more  
usable both by people with disabilities  
and by users with a variety of  
computers. The AGPD has educated  
Pacific Bell about the value of keeping  
the VT100.

**Other Recommendations  
and Pacific Bell's Response**

There are many other areas of  
opportunity the AGPD discussed with  
company leaders that do not fall into  
specific recommendations for products  
or applications. The suggestions that  
follow address strategies to better reach  
customers with disabilities about  
programs and products.

**16) Increase efforts to inform  
customers about the equipment  
lending program. Develop and  
use a comprehensive mailing list  
of organizations serving people  
with disabilities, seniors, and  
limited English-speaking  
communities.**

Pacific Bell's Deaf and Disabled Services provides assistance to only a fraction of the eligible customers it could ideally serve — about 130,000 out of more than 5 million people. Not everyone who is eligible will take advantage of the service: some prefer to buy their own equipment, others mistakenly think that the program requires low income status, still others who have significant functional disabilities do not consider themselves deaf or disabled.

Pacific Bell needs to reach out aggressively to these organizations and find ways to help them inform their constituencies about the equipment available and how easy it is to obtain. Seniors and the Spanish-speaking community especially need to be targeted for outreach. Pacific Bell should work with service providers who are sensitive to cultural differences in preparing more effective communications with limited English-speaking communities. The company must take steps to increase its outreach to customers who qualify.

#### **Company Response:**

Deaf and Disabled Services (DDS) staff continues to expand its outreach program. We have developed a data base of over 600 agencies that work with people with disabilities in California. These agencies receive several mailings from DDS each year.

We are also conducting an internal awareness campaign aimed at the Residence Business Offices and the Public Offices.

We have also developed a video about the equipment lending program that we will send to both the agencies in our data base and to Pacific Bell business offices. We will focus on promoting the equipment lending program to seniors in 1994 by targeting outreach presentations and direct mail.

DDS is also developing a Spanish version of its brochure, and placing ads in publications that serve Spanish and Asian language populations. Increasing outreach in these communities is a priority. Additionally, we are targeting people with disabilities who live in rural areas through outreach.

#### **❖ Change the name of the program to reflect a functional emphasis.**

Toward the end of 1993, after nearly a year getting to know the company and its many helpful resources, the AGPD suggested that the name "Deaf and Disabled Services" deters many potential customers with disabilities who do not identify as "deaf" or "disabled". The two largest disabilities — hard-of-hearing and mobility disabilities — predominate among older adults who aren't born with disabilities but acquire them with age.



We believe this group is unlikely to respond to information or programs when they are labeled "Deaf and Disabled Services." The AGPD prefers the name **Pacific Bell Resources for Accessibility (PBRFA)**. When targeting communications specific disabilities could be added to the name. (e.g. PBRFA for seniors, PBRFA for the deaf, etc.). Pacific Bell should also consider multiple listings in the white pages so different disabilities can easily locate the service.

#### **Company Response:**

Feedback gathered from focus groups of people with disabilities has supported the concept of changing the name of the program. Pacific Bell is currently conducting market research with customers who have received equipment from Deaf and Disabled Services, including specific questions on the name change proposal. Preliminary results of that research indicates customers do not have strong ties to the current name, and will be receptive to a new name. A decision on the name change will be made in mid 1994.

#### **17) Include people with disabilities in advertising and marketing campaigns.**

One overriding goal of people with disabilities, regardless of particular issues and strategies, is to have the same opportunities as everyone else. To that end, the AGPD applauds Pacific

Bell's previous advertising campaign. In its video portrayal of the full diversity of the people of California, including a person with a disability, it helped illustrate the company's message: "Good Enough Isn't."

The company should continue reinforcing the message in its next advertising campaign that people with disabilities are part of the social landscape. For example, background shots of a downtown district at noon might include a wheelchair user, or shots of people using the phone might include seniors with large button sets, a hard-of-hearing customer using phone amplification, or a blind person operating a phone set equipped with voice dialing. People with disabilities should be included in developing advertising ideas, as well as in focus groups that test those ideas during theme development. Ads should let the viewer see that we are among many people of California who use Pacific Bell's products and services.

#### **Company Response:**

Market Communications aggressively seeks opportunities to represent the diversity of California in advertising campaigns. Recent ads which feature people with disabilities include the "Good Enough Isn't" series showed a kayaker who is also a wheelchair rider and a young girl who is autistic; and the "It's real California" series showed a background shot of a wheelchair rider.

During our meeting with the AGPD, we learned more about the presence/absence of people with disabilities in Pacific Bell advertising campaigns. Other discussion points from the AGPD meeting under consideration include:

- Use people with disabilities in the background of commercials/photographs.
- Background music in commercials is often too loud, decreasing the ability to hear the words for people with impairments.
- Request for larger type in collateral and advertising.
- How to target seniors better, since they don't perceive themselves as "deaf or disabled".

- Opportunity to feature in advertising those service representatives who educate customers on use of special equipment for people with disabilities.
- Be careful not to segregate people with disabilities when depicting groups of people in advertising.
- In advertising directed toward people with disabilities, focus on ability and the fact that customers can do these things with the special products.

As we develop commercials we'll continue to evaluate opportunities for casting that is inclusive of all California customer groups, including people with disabilities.

## CHAPTER 3

# CREATING ACCESSIBLE FUTURE PRODUCTS

Over the course of the past year, the AGPD has had the opportunity to witness firsthand many of Pacific Bell's plans for future technology. We've talked with many of the key company leaders spearheading efforts to bring to market technologies that will affect California's future — broadband (both audiotext and videotext applications), Advanced Intelligent Network, ISDN, Voice Dialing<sup>™</sup>, electronic publishing, and enhancements to Operator Services.

Since the influence of PCS and broadband will be pervasive, and both loom large on the policy as well as social horizons, it seems inevitable that at some point there will be requirements to **make** these services accessible to the disability community, if they aren't already. We believe the company needs to think about the many issues of accessibility **now**. That urgency is highlighted by the rapid growth of new competition within telecommunications and proposed changes in regulatory policy.

The prospects of broadband and PCS technologies hold great promise for all Californians, but the company needs all the support it can muster to build the

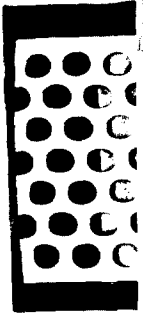
information network it envisions. It must not exclude from its design plans the more than 5 million people with disabilities who require equal access to these technologies.

It is not yet clear how PCS and broadband will influence the redefining of Universal Service, but both technologies are certain to be important. If the society that evolves over the next decade comes to take these new personal communications and information tools for granted, then people with disabilities must be provided the means to take them for granted as well.

### Personal Communications Services

Mobile communications are not simply luxury services for many people with disabilities. We envision PCS as a major tool for people with disabilities who need more efficient accessibility to communications than they have today.

In order for PCS to be truly accessible to all customers, both the equipment and the network will have to be developed so that people with



disabilities are included in the design plan. Pacific Bell must use its leverage with equipment manufacturers to make sure PCS products are as accessible as the network. (See sidebar)

Developing PCS applications for people with disabilities from the beginning can also help Pacific Bell gain crucial marketing intelligence. The uses that customers with disabilities employ for PCS may reveal unexpected insights about how all other people might use PCS.

## Broadband

Broadband presents another set of challenges and opportunities. The access concerns of people with vision and speech disabilities become even more acute regarding the much vaunted Information Superhighway.

Certain employment and educational opportunities for people with disabilities will hinge on having full accessibility to many of these services.

Some in the information services industry claim that the disability market is very similar to the home office market. Many people with disabilities are interested in broadband applications that will allow them, like others, to work at home, and so the market potential of telecommuting-related services, according to certain analysts, is large.

## Who Needs PCS?

Whatever technology evolves for PCS, it must be able to accommodate people with different needs, including those with special devices to plug into the PCS network. The list includes:

- Customers who need or want amplified phones
- Customers who need or want phones with large buttons
- Customers who need or want speaker phones
- Customers who require voice dialing
- Customers who can't reach the pay phone coin slots
- Customers with vision impairments who cannot locate pay phones
- Customers who use TDDs.

These are among the customers who will want to use PCS to make their lives easier and their ability to communicate less burdened by physical or geographical constraints.

While the AGPD supports the use of broadband technology to bring the latest network applications into the homes of people with disabilities, a strong note of caution is in order. We

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do **not** support the use of broadband or any other telecommunications technology that might limit employment opportunities for people with disabilities to those jobs that can only be conducted in their homes. In other words, we oppose work-at-home technologies as a **substitute** for the active inclusion of people with disabilities in the workplace.

Our goal is more choice and accessibility, not further segregation and confinement. **The AGPD wants broadband applications to be provided through redundant channels in order that people with disabilities have equal access to information sent and received over the so-called information highway now evolving.**

We intend to be major users of that highway, and need the active efforts of major players like Pacific Bell to insure that we have on-ramps

Finally, there is a technical issue related to future broadband developments that the AGPD considers critical: the problem of the interface; more specifically, the Graphical User Interface (GUI). It is included below among our recommendations for making broadband accessible to people with disabilities.

Redommendations and Pacific Bell's Response

Personal Communications Services

18) **Assign top priority to implement Voice Dialing<sup>tm</sup> for PCS.**

The company should investigate several PCS applications that address specific functional disabilities (see next recommendation). To get started the company should investigate voice activation services for people with limited vision and mobility. In doing so, the company should implement technology that employs sophisticated voice recognition capability that can be used by speech impaired customers as well as other users.

Company Response:

Pacific Bell agrees with this recommendation. As the technology permits we will begin our work. Some terminal equipment available today for cellular use incorporates Voice Dialing<sup>tm</sup> capabilities, and such equipment will certainly be available for PCS. The development of Voice Dialing<sup>tm</sup> capabilities within Pacific Bell's core network can be made available to all wireless providers, including PCS providers. Pacific Bell will continue to actively work with equipment manufacturers to develop Voice Dialing<sup>tm</sup>, voice recognition services and equipment for PCS.

- 19) Pacific Bell should set vendor standards for equipment and network services in order to address major concerns for the following customer categories:

People with limited vision or blindness

- ❖ Provide raised buttons on PCS-phone sets.
- ❖ Provide audible displays and feedback of keys pressed.

People who are deaf

- ❖ Provide phones that use non-auditory signaling (e.g., vibration).
- ❖ Supply phones that can translate network signals (dial tone, busy signals) onto a visual display.
- ❖ Provide Baudot tones for TDD in addition to voice prompts for other users.

People with hearing impairments

- ❖ Provide PCS-phone sets that are hearing aid- and amplifier-compatible.

People with mobility impairments

- ❖ Provide PCS-phone sets with adequate spacing between buttons that are easy to depress.

People with cognitive difficulties

- ❖ Provide more user control over the speed of network information (e.g., instruction prompts that allow users to back up, skip, slow down, repeat information).

**Company Response:**

Customers with disabilities will be important users of PCS. Pacific Bell believes that equipment and network services should be usable to people with a wide range of functional needs. It is likely that Pacific Bell will not partner with a single manufacturer for PCS. We will incorporate universal design principles into RFPs from equipment manufacturers, educate potential vendors about the importance of considering the needs of this market, as well as the revenue potential of this segment.

**20) Include people with disabilities in all PCS trials.**

**Company Response:**

Pacific Bell has and will continue to identify potential customers, including people with disabilities, for all market and technology trials. In the San Diego PCS Market Trial, conducted by Telesis Technologies Laboratory (1993), 5% or 68 people who participated identified themselves as having a disability.



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**21) Develop and market PCS as a "wayfinding" tool to assist users in determining locations, and also as an environmental control device.**

PCS could be used to assist in determining location. Like the Pacific Teletrac system that operates on radio frequencies to help identify stolen or lost vehicles, the PCS network could be adapted to help determine where a caller is calling from, or allow the user to "key back" to a centralized data bank to find important or desired locations in relation to the caller (i.e., the nearest bus stop, the closest pharmacy, etc.). These services would specifically assist travelers, people with Alzheimer's, children, and blind people.

PCS could also be adapted for controlling one's living environment; e.g., turning utilities on and off by use of the handheld device, programming appliances in the home, etc.

**Company Response:**

Pacific Bell has been actively working with equipment manufacturers to develop the means of providing general location (within 400-500 feet) information through wireless networks for emergency service agencies. Pacific Bell will continue its efforts to develop this capability. The technology, even using satellites, to notify the user that

he/she is on the southeast corner isn't commercially available today.

The idea of a single communication device capable of interacting with other devices by way of voice, data, or image formats is one that many in this industry embrace. Pacific Bell intends to continue to be a leader in developing telecommunication services that bring consumers closer to that ideal.

**22) Aggressively market PCS to people with disabilities, demonstrating its advantages both inside and outside the home.**

Some of the uses for both home and mobile use of PCS have already been described. Another application for product developers/marketers to consider: PCS provides an ideal alternative to coin telephones for many customers with disabilities.

Coin telephones are not accessible to a large number of people with disabilities. For example, blind customers cannot find coin phones; many customers with mobility limitations cannot use coin phones; hard-of-hearing and deaf customers cannot use phones that do not have amplifiers or TDDs. PCS properly designed for these customers will provide dramatically improved access to the network away from home.

**disabilities**

**Company Response:**

Pacific Bell will actively target this market by recognizing the needs of people with disabilities and providing appropriate services. PCS will be a highly competitive market, and the companies that succeed must be able to understand and respond to consumer needs better than the competition.

When Pacific Bell sets the policy and strategic direction for the PCS marketing campaign it will take into consideration the issues in recommendation 17. The advertising strategy could include demonstrating product advantages in the most relevant way for people with disabilities.

**Broadband**

**23) Include people with disabilities in all phases of broadband trials.**

**Company Response:**

We agree that people with disabilities should be included in all phases of broadband trials. By including this segment, PBIS can gather feedback from potential market and increase usability for all customers. Currently, the trial planned for broadband will be in Milpitas in 1994. PBIS will include customers with disabilities in this trial as long as we can identify them in the neighborhood selected.

**24) Design redundancy in the use of interfaces for broadband products and services.**

Graphics User Interfaces (GUI) are popular with software designers and many computer users today, but difficult for people with vision and cognitive disabilities because they are difficult or impossible to be translated into voice output. Because GUIs are designed to be interpreted through visual images, those with vision disabilities find themselves unable to use GUIs gateways, which do not lend themselves to the sequential presentation of information necessary for voice translation devices.

There are 1.5 million people in California with vision disabilities who would be left behind if GUIs are the exclusive gateway for Pacific Bell broadband products.

In addition, for those requiring a larger print size, the icons used in GUIs are often difficult to distinguish even when enlarged. Icons often require the user to be able to distinguish between figure and background, which low vision users may not be able to accomplish. GUIs are often used in tandem with a mouse, which presents problems for many people whose disabilities impede manipulation.





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Designers of Pacific Bell's broadband gateway should take into consideration the needs of people with disabilities. **We recommend that early on, Pacific Bell develop an alternative interface in addition to GUIs when designing for multiple users of broadband.** (Pacific Bell's Knowledge Network Gateway is an application that already provides both GUI and text interfaces).

More people than just those with vision impairments — for example, people with learning disabilities and other cognitive impairments — would benefit from an alternative.

Human Factors and computer experts have told us that interfaces won't improve until enough users complain about them, and until interface designers come to better understand and accept the way the human mind actually works on tasks. GUIs are often not compatible for anybody. Interfaces could and ought to be designed that are simpler and more efficient for mass consumption.

Once again, designing an application for people with disabilities can point toward more innovative applications for the mass market as well.

- 25) Allow customers to select a mode in which they give and receive information.**

No service offered by Pacific Bell over an enhanced, broadband network should be available to users through voice activation alone, nor should it only be available by visual indicators on a computer screen. Allowing customers to select the mode in which they send and receive information will help people with different disabilities while offering more choices for everyone.

Human Factors Engineering can help determine the most appropriate formats that can facilitate gateway access to broadband applications for people with different disabilities.

#### **Company Response to Recommendations 24-25:**

PBIS is committed to building in some redundancy in broadband interfaces. We need to obtain more information on designing accessible interfaces so we can make the best business decisions. When Pacific Bell is the content provider we will actively pursue developing "hooks" that can be accessed by existing (and future) technologies. We believe many customers want to choose the format in which they receive information. We will also meet with experts in this field and work with them on developing solutions that meet the needs of a wide spectrum of customers while allowing us to remain competitive in the broadband market.